

R.M.U. USE ONLY
PROBLEM STATEMENT NO:
DATE OF RECEIPT:



STAGE I RESEARCH PROBLEM STATEMENT

I. PROBLEM TITLE (required):

Laboratory Evaluation of Subgrade Soils

II. PROBLEM STATEMENT (required):

Many soils in Montana pose significant problems for constructability and long-term pavement performance. The current method (R-value testing) used by the Department for quantifying the suitability of these soils for subgrade strength may yield unsatisfactory results. Other investigatory techniques may yield more consistent and reliable results, which will improve pavement performance and save significant construction and maintenance funds. Two other testing methods are in common use: the California Bearing Ratio and the Resilient Modulus test. Furthermore, several state DOTs are evaluating the use of Atterberg Index tests for correlation to mechanistic pavement design and subgrade improvement.

III. RESEARCH PROPOSED (required):

Proposed research includes a comprehensive literature review of the state of the practice in current testing used in subgrade evaluation. Additionally, it is recommended that several problem soils be evaluated using California Bearing Ratio and Resilient Modulus testing. Lacustrine silts from Montana's glacial lakes are particularly problematic, however, expansive clays derived from Cretaceous shales in the Eastern regions of the state warrant evaluation also. If greater reliability and ability to distinguish problem subgrade soils is found with one of these methods, this research should conclude with recommendations to augment current MDT testing with the more reliable test method. Research into the practicality of implementing the proposed test method should be included in the conclusions.

IV. IT COMPONENT (required): Identify if the project includes an IT component (purchasing of IT hardware, development of databases, acquisition of existing applications, etc) or not. If so, describe IT component in as much detail as possible.

This research should not require IT involvement.

V. URGENCY AND EXPECTED BENEFITS (required):

This research is quite urgent, as the testing method utilized for subgrade strength determination can have an impact on both expensive premature pavement failures and expensive overconservative pavement designs. Millions of dollars could be saved in perpetuity by updating subgrade evaluation techniques. Furthermore, the roadways will become more stable, enhancing driver safety and satisfaction with the highways that are our product.

VI. IMPLEMENTATION PLAN (required):

If another testing method of subgrade testing proves more reliable in predicting subgrade strength based on this research, we will replace the "R-value" test with this test. It would also be very desirable to eliminate the need for "R-value" testing during construction if possible.

VII. SUBMITTED BY: (required)

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Note: Submitter may attach continuation sheets if necessary.